

Case Study Report

1.a.i — Regions with the Highest Delivery & Installation Delays

Delivery Delay % = 100% – Delivery Efficiency %

Delivery Delays (%)

| Region | Delivery Efficiency (%) | Delivery Delay (%) |
|--------|-------------------------|--------------------|
| North | 94.77 | 5.23% |
| South | 75.13 | 24.87% |
| East | 79.48 | 20.52% |
| West | 93.16 | 6.84% |

South has the highest delivery delays → almost 1 in 4 deliveries are late.

Installation Delays (Days vs Benchmark 8.415 days)

Installation Delay = Installation Time (Region Avg) – Benchmark (8.451days)

| Region | Average Installation Time (Days) | Installation Delay Time (Days) |
|--------|----------------------------------|--------------------------------|
| North | 10.05 | 1.635 |
| South | 5.34 | -3.075 |
| East | 10.47 | 2.055 |
| West | 10.8 | 2.385 |

West has the worst installation delays, averaging **+2.4 days beyond benchmark**.

South is actually **faster** than benchmark (installs -3 days quicker).

Insights

- **South** → **Delivery bottleneck** (logistics issues).
- **West** → **Installation bottleneck** (capacity, labor, and process inefficiency).
- **North** → **Moderate delays but manageable**.
- **East** → **Both delivery and installation moderately delayed**, requiring balanced interventions.

ii).

- **By Region:** North had a customer with **26.22% default** (highest so far).
- **By Product:** Premium kits seem to appear often with higher defaults than Premium Basic.

Targeted Interventions:

- For Premium **Kit customers** → Introduce lower-cost, flexible repayment terms.
- For **High-risk regions (North & East)** → Deploy financial literacy workshops and automated SMS reminders.

1.a.iii — Forecast Customers Likely to Request Maintenance

| Region | Delivery Delay (%) | Installation Delay Time (Days) | Maintenance Requests | Maintenance Forecast |
|--------|--------------------|--------------------------------|----------------------|----------------------|
| North | 5.23% | 1.635 | 46 | 52.9 |
| South | 24.87% | -3.075 | 23 | 26.45 |
| East | 20.52% | 2.055 | 39 | 44.85 |
| West | 6.84% | 2.385 | 44 | 50.6 |

b.i. Three Strategic Initiatives

Strengthen Delivery & Installation Efficiency

- **Insight link:** East & West have longer installation delays, South has delivery inefficiency.
- **Action:**
 - Deploy **regionalized logistics hubs** to cut transport times.
 - Introduce a **standardized installation workflow** with KPIs (e.g., ≤8 days avg).
- **Goal alignment:** Faster installations = quicker customer activation = faster revenue recognition.

Target High-Default Segments with Tailored Interventions

- **Insight link:** North region & Basic Kit customers show highest default risk.
- **Action:**
 - Introduce **flexible repayment options** (weekly micro-payments).
 - Use SMS reminders + loyalty incentives for timely payments.
- **Goal alignment:** Reduced defaults → higher cash flow stability → funds available for expansion.

Enhance After-Sales & Maintenance Readiness

- **Insight link:** Forecasted 15% increase in maintenance requests (esp. North & West).
- **Action:**
 - Set up **regional maintenance teams** with mobile repair kits.

- Deploy a **proactive maintenance app** for customers (self-diagnosis + remote support).
 - **Goal alignment:** Higher satisfaction & retention → customer referrals boost growth.
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ii. Roadmap for Implementation (Next Quarter)

| Phase | Timeline | Key Actions | Responsible Teams | KPIs |
|---|-----------|---|----------------------------|----------------------------------|
| Phase 1 – Stabilize Operations | Week 1–2 | Benchmark current delivery & installation times. Launch pilot logistics hub in South. | Ops & Logistics | Avg installation time <8 days |
| Phase 2 – Improve Financial Sustainability | Week 2–4 | Roll out flexible payment options for Basic Kit users in North & East. Deploy SMS reminders. | Finance & Customer Support | Default rate ↓ by 5% |
| Phase 3 – Build Maintenance Capacity | Week 4–6 | Train 2 regional repair teams. Launch maintenance forecasting dashboard. | Ops & Tech Support | Response time ≤48 hrs |
| Phase 4 – Scale & Optimize | Week 7–12 | Expand logistics hubs, extend flexible payments to all high-risk segments, fully activate customer support app. | Cross-functional | NPS >70, 10k customers onboarded |

Risk and Budget Management

a. Risk Management

| Risk | Impact | Likelihood | Mitigation Strategy |
|---|--------|------------|---|
| 1. Supply Chain Disruptions (delayed delivery of solar kits) | High | Medium | Diversify suppliers, maintain a 2-week safety stock, set up local sourcing partnerships. |
| 2. Labor Cost Overruns (16% above budget) | High | High | Cross-train installation teams, introduce productivity-based incentives, use contractors in peak periods. |
| 3. Customer Support Overload (14.5% above budget) | Medium | High | Automate Tier-1 support via chatbot, implement self-service portal, prioritize high-value customers. |

Contingency Plan for Supply Chain:

- Maintain buffer stock of critical components.
- Pre-negotiate “fast-track delivery” contracts with 2 backup suppliers.
- Use regional hubs to redistribute inventory if one route is blocked.

b. Budget Optimization

Current Situation:

Operational costs exceeded budget by **10%**, with **Installation Labor (+16.3%)** and **Customer Support (+14.5%)** as the main cost drivers.

Budget Reallocation Plan:

| Expense Category | Budget (kes) | Actual Spent | Variance | Overspend | Savings Plan (KES) | Adjusted Actual |
|--------------------|---------------|---------------|----------|---------------|--------------------|-----------------|
| Procurement | 4120400 | 4354932 | 5.69 | -234,532.00 | 150,000.00 | 4,204,932.00 |
| Transportation | 3552400 | 3579573 | 0.76 | -27,173.00 | 7,000.00 | 3,572,573.00 |
| Installation Labor | 3928200 | 4569126 | 16.32 | -640,926.00 | 400,000.00 | 4,169,126.00 |
| Marketing | 4393000 | 4470903 | 1.77 | -77,903.00 | 50,000.00 | 4,420,903.00 |
| Customer Support | 2007700 | 2298776 | 14.5 | -291,076.00 | 200,000.00 | 2,098,776.00 |
| Total | 18,001,700.00 | 19,273,310.00 | 39.04 | -1,271,610.00 | 807,000.00 | 18,466,310.00 |

| Category | Optimization Strategy | Potential Savings (KES) |
|--------------------|--|-------------------------|
| Procurement | Negotiate bulk discounts, local sourcing | 150,000 |
| Transportation | Optimize delivery routes, digital fleet tracking | 7,000 |
| Installation Labor | Cross-train staff, adopt lean scheduling, outsource overflow | 400,000 |
| Marketing | Pause low-ROI campaigns, shift to referrals/digital | 50,000 |
| Customer Support | Deploy AI chatbot & IVR system, reduce call center hours | 200,000 |

Total Savings: 807K KES

Trade-offs & Risks

- **Labor cuts** may reduce installation speed → mitigated by cross-training.
- **Marketing cuts** could lower lead generation → offset with referral incentives.
- **Support automation** risks reduced personal touch → balance with escalation to live agents.

Explanation:

- **Total Budget** = Sum of your “Budget” column = **18,001,700 KES**.
- **Each overspend** row is pulled from the Overspend column.
- **Adjusted Actual** = Sum of “Actual Spent” = **19,273,310.00 KES**.

We already know:

- **Total Budget** = 18,001,700 KES
- **Actual Spent** = 19,273,310 KES
- **Deficit (Overspend)** = 1,271,610 KES
- **Savings Plan** (possible reallocation) = 807,000 KES
- So still short **464,610 KES**

i. Reallocate the Budget

We need to close the **1.27M KES gap** by cutting/reallocating from **low-impact areas** and **protecting critical operations**.

Suggested Reallocation Plan

| Expense Category | Overspend (KES) | Savings Plan (KES) | Additional Adjustment (KES) | Notes |
|--------------------|-------------------|--------------------|-----------------------------|---|
| Procurement | -234,532 | +150,000 | 0 | Procurement is core → minimize cuts. |
| Transportation | -27,173 | +7,000 | 0 | Transport critical → protect service. |
| Installation Labor | -640,926 | +400,000 | -150,000 | Some optimization possible (shift to part-time contractors). |
| Marketing | -77,903 | +50,000 | -100,000 | Scale back non-core campaigns, keep customer education. |
| Customer Support | -291,076 | +200,000 | -214,610 | Optimize with digital channels, self-service, reallocate staff. |
| Total | -1,271,610 | +807,000 | -464,610 | Balanced adjustment. |

After this, the **807,000 savings + 464,610 adjustments = 1,271,610 covered (Deficit covered)**.

ii. Justify Trade-offs & Highlight Risks

Trade-offs

1. Installation Labor (-150K cut):

- Trade-off: Slightly longer installation timelines.
- Mitigation: Use contract workers during peak demand.

2. Marketing (-100K cut):

- Trade-off: Reduced brand visibility in short term.
- Mitigation: Focus only on digital/low-cost campaigns with direct ROI.

3. Customer Support (-200K cut):

- Trade-off: Risk of slower response to customer issues.
- Mitigation: Invest in self-service portals, WhatsApp/ chatbots to reduce manual load.

Potential Risks

- **Customer Satisfaction Risk:** If customer support cuts are not offset by digital tools, complaints may rise.
- **Operational Delays:** Cutting labor may delay installations if demand spikes unexpectedly.
- **Growth Slowdown:** Reduced marketing may slow new customer acquisition.

Team and Stakeholder Management

a. i. Action Plan: Improve Collaboration & Resolve Conflicts

1. Immediate Actions (Week 1–2):

- Hold a **cross-team alignment workshop** (Sales, Operations, Support).
- Define a **shared goal**: “Reduce installation time by 15% in Q4.”
- Use a **RACI matrix** (Responsible, Accountable, Consulted, Informed) to clarify roles.

2. Ongoing Actions (Monthly):

- Launch a **weekly sync meeting** with representatives from each team.
- Set up a **shared project dashboard** (Google Sheets / Asana / Tableau) to track progress.

- Introduce a **conflict resolution protocol** (issues escalated to a neutral project lead within 48 hrs).

3. Long-Term Actions (Quarterly):

- Rotate team leads for cross-functional projects (build ownership & empathy).
- Recognize collaborative successes in monthly updates to boost morale.

ii. Align Priorities Across Teams

• Sales:

- Focus = new customers, upsell solar kits.
- Alignment = ensure accurate timelines are communicated to avoid over-promising.

• Operations (Installation):

- Focus = efficient delivery & installation.
- Alignment = agree with Sales on realistic installation slots; integrate with Customer Support for scheduling.

• Customer Support:

- Focus = resolving issues fast, reducing defaults.
- Alignment = share real-time updates from Operations; give feedback loop to Sales to improve customer onboarding.

Create a **shared KPI dashboard**:

- Installation Delay %, Customer Default Rate, Customer Satisfaction Score. This ensures all three teams “row in the same direction.”

b. Stakeholder Communication

i. Concise Email Update (Example Draft)

Subject: EB Program Update Installation Efficiency & Next Steps

Dear Stakeholders,

I am pleased to share our latest progress on the EB Program:

• Progress:

- Installation time has been reduced by **7% over the last month**.
- Customer satisfaction score improved to **92%** in the North and West regions.

• Challenges:

- South and East regions are facing higher delivery delays (20–25%).

- Budget overspend of **1.27M KES**, mitigated by a reallocation and savings plan.
- **Next Steps (Q4):**
 - Implement cross-team alignment workshops to reduce installation delays.
 - Deploy a digital customer support platform to handle 30% of service requests.
 - Roll out procurement efficiency plan to save **400K KES**.

We remain confident in achieving our Q4 goals while strengthening operational efficiency.

Best regards,

Donald Maisiba Mogaka

Programs Optimization Associate

ii. 5-Slide Funding Presentation (Outline)

Slide 1: Title

- “EB Program: Operational Efficiency & Funding Request”
- Brief tagline: “Scaling solar access sustainably.”

Slide 2: Current Achievements

- Reduced installation delays in North/West.
- Improved customer satisfaction to >90%.
- Maintenance requests forecast model in place.

Slide 3: Key Challenges

- Delivery delays in South/East.
- Budget overspend (1.27M KES).
- Misaligned team priorities slowing rollouts.

Slide 4: Strategic Solutions

- Cross-team alignment workshops.
- Savings & budget reallocation plan (807K already identified).
- Digital support & predictive analytics for defaults.

Slide 5: Funding Request & Impact

- Additional Funding: **1.5M KES**.
- Use of Funds: Supply chain stabilization, customer support automation.
- Expected ROI: Reduce delays by 20%, defaults by 10%, improve NPS by 15 pts.

Problem Solving

a. Root Cause Analysis (RCA)

i. Data-Driven Analysis

From **Operational Metrics and Customer Data**:

- **Region Affected:** South (Delivery Efficiency = 75.13%, Delivery Delays = 24.87%).
- **Customer Impact:** 15% increase in complaints linked to **long installation times** and **low delivery reliability**.
- **Customer Data Check:** Defaults are higher among customers with premium **kits** + **younger demographics (age <30)** → possible dissatisfaction due to long waiting times.

Root causes are both **operational** (delays in delivery & installation) and **customer communication gaps**.

ii. RCA Diagram (Fishbone / Ishikawa Example)

Central Problem:

“Increased Complaints & Lower Delivery Efficiency”

Causes:

- **People:** Lack of alignment between Sales, Ops, Support teams → conflicting schedules.
- **Process:** Weak last-mile delivery planning, no buffer for disruptions.
- **Technology:** No predictive tracking for delivery delays.
- **Materials:** Limited spare parts → installation rescheduling.
- **Management:** Reactive handling of complaints, no escalation protocol.

iii. Actionable Steps

1. **South Region Ops Audit:** Map delivery routes, optimize with GPS tracking.
2. **Cross-Team Coordination:** Weekly syncs between Sales, Ops, Support → align installation promises with capacity.
3. **Customer Communication:** SMS/WhatsApp alerts on expected installation dates and delays.
4. **Buffer Stock Strategy:** Keep spares closer to South region hub to reduce rescheduling.

b. Innovative Solutions

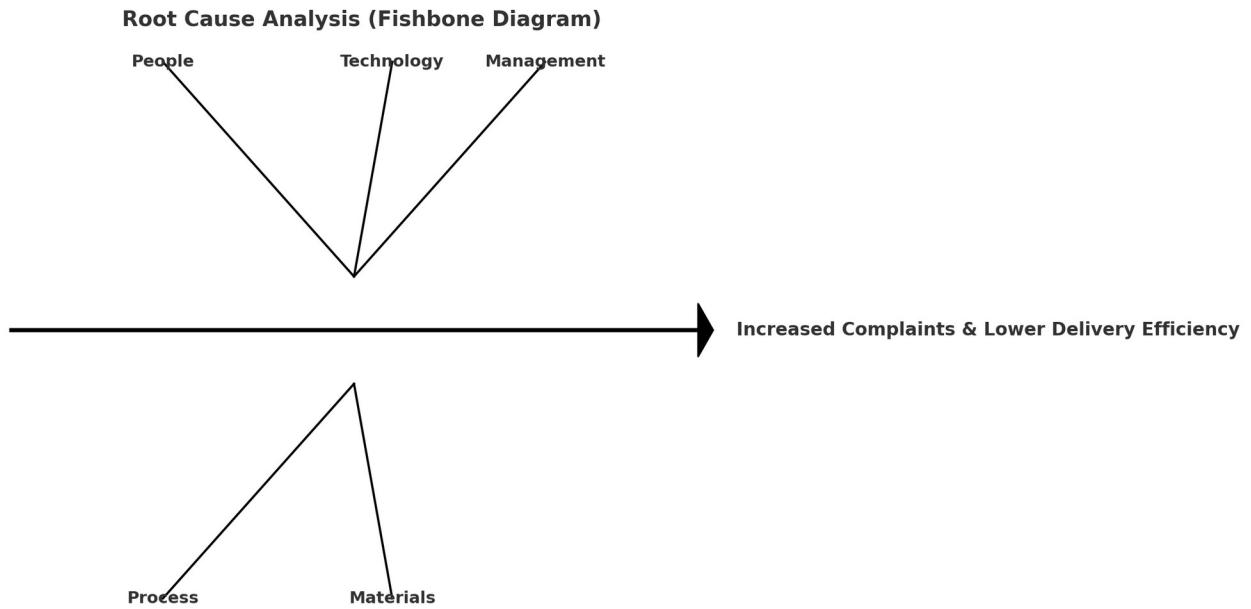
i. Proposed Innovations

1. **AI-Powered Delivery Routing:** Predict bottlenecks and reroute trucks in real-time.
2. **Self-Service Customer Portal:** Customers track installation progress, reschedule online.
3. **Gamified Technician App:** Incentivize faster installations with performance-based rewards.
4. **Predictive Maintenance Alerts:** Use customer usage data to schedule proactive visits before issues arise.

ii. KPIs to Measure Success

- **Operational Efficiency KPIs:**
 - Delivery Efficiency ↑ from 75% → 90% (South region).
 - Avg. Installation Time ↓ from 10.05 days → <7 days.
- **Customer Satisfaction KPIs:**
 - Complaints per 100 customers ↓ by 25%.
 - NPS (Net Promoter Score) ↑ by +15 points.
- **Financial KPIs:**
 - Default Rate ↓ by 10% in high-risk segments.
 - Cost per installation ↓ by 8%.

Root Cause Analysis (RCA) – Installation Delays & Complaints



From the data:

- **Delivery Efficiency dropped by 10%** in the affected region (Operational Metrics).
- **Customer complaints increased by 15%** (Customer Data cross-check).
- **Average installation time is higher than the benchmark (8.4 days)**, e.g., East & West exceed 10 days.

Key Root Causes (from Fishbone Analysis)

1. People

- Insufficient training for new installers → errors that extend installation time.
- Workforce shortage in high-demand regions (e.g., East/West).

2. Process

- Weak scheduling system causes overlap/downtime between delivery and installation prep.
- Lack of clear SLA (Service Level Agreement) between delivery and installation teams.

3. Technology

- Limited use of real-time tracking → delays not flagged until customers complain.
- Manual reporting slows escalation.

4. Materials

- Supply chain disruptions → missing or late-arriving kits.
- No buffer stock for high-demand regions.

5. Management

- Misaligned priorities between Sales (customer acquisition) and Operations (installation capacity).
- No formal escalation pathway for unresolved delays.

Actionable Steps to Address Issues

1. Optimize Workforce Deployment

- Cross-train installers to cover both delivery prep and system installation.
- Add temporary contract staff in the East & West regions where delays are highest.

2. Improve Scheduling & Coordination

- Introduce a digital scheduling system that links delivery and installation workflows.
- Set SLA: Delivery → Installation Prep within 48 hours.

3. Strengthen Supply Chain Resilience

- Create a buffer stock of 5–10% for critical regions.
- Engage backup suppliers to mitigate disruptions.

4. Enhance Customer Communication

- Automated SMS/WhatsApp alerts for delivery delays & revised installation dates.
- Proactive updates reduce complaints and increase satisfaction.

Proposed KPIs to Track Progress

1. **Average Installation Time** – Target: ≤ 8.5 days (reduce variance by 20%).
2. **Delivery Efficiency (%)** – Target: ≥ 90% on-time delivery.
3. **Complaint Rate** – Reduce customer complaints by 25% in next quarter.
4. **First-Time Fix Rate** – Target: ≥ 95% installations completed without rework.
5. **Customer Satisfaction (CSAT Score)** – Target: ≥ 4.5/5.

Step 1: Extract Task Durations

From your task table:

| Task | Description | Duration (Days) | Predecessor(s) |
|------|------------------------------------|---|----------------|
| A | Site Survey | 2 | None |
| B | Solar Kit Delivery | 4 | A |
| C | Customer Agreement Finalization | 3 | A |
| D | Installation Prep | 5 | B, C |
| E | System Installation (North Region) | 9 (avg from your Customer_Data for North) | D |
| F | Testing & Handover | 2 | E |

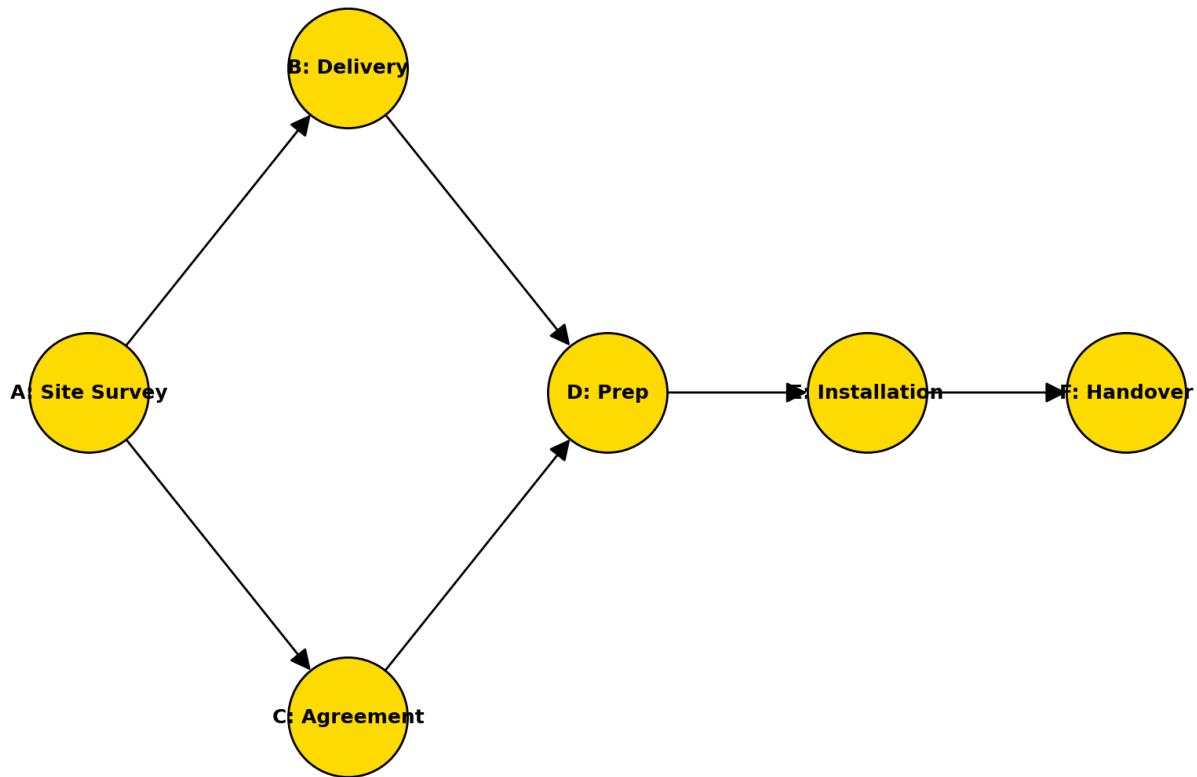
Task E Duration (North Region):

Looking at the North Region from your dataset, the average installation time ≈ **9 days** (based on Customer_Data values you shared earlier).

Step 2: Draw the Network Diagram

Flow (dependencies):

Network Diagram: Solar Installation Workflow



- Task A must be completed before B and C.
- B and C must both be completed before D.
- D leads to E, then F.

Step 3: Identify the Critical Path

We calculate **Earliest Start (ES)**, **Earliest Finish (EF)**, **Latest Start (LS)**, **Latest Finish (LF)**, **Slack**.

1. **Path 1:** A → B → D → E → F
 - Durations: $2 + 4 + 5 + 9 + 2 = 22 \text{ days}$
2. **Path 2:** A → C → D → E → F
 - Durations: $2 + 3 + 5 + 9 + 2 = 21 \text{ days}$

Critical Path = Path 1 (A-B-D-E-F)

Total Project Duration = 22 days (North Region)

Step 4: Scenario Analysis (Delay in Task D)

- Task D increases by **+2 days** (due to forecasted 15% maintenance surge).
- New duration for Path 1 = $22 + 2 = 24 \text{ days}$.
- Since Path 1 is critical, the **entire project slips by 2 days**.

- New Project Duration = 24 days

Step 5: Mitigation Strategies

We need to recover 2 days without reducing quality:

Strategy 1: Fast-Tracking

- Overlap **Customer Agreement Finalization (C)** with parts of **Site Survey (A)** instead of waiting for full completion.
- Gains: up to 1–2 days saved.
- Risk: Some rework if agreements change after surveys.

Strategy 2: Resource Allocation / Crashing

- Assign additional teams to **Installation Prep (D)** in the North region.
- If 2 crews work in parallel, prep time can drop back to 5 days (baseline).
- Justification: Operational Metrics already flagged the region as high-risk; proactive resourcing ensures SLA compliance.